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EXAMINER

CHAWAN, VIJAY B

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,327

Applicant(s)

BU ET AL.

Examiner

Vijay B. Chawan

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/19/2002</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Taiwan on 7/13/2000. It is noted, however, that applicant has not filed a certified copy of the Taiwan Application serial number 89114002 application as required by 35 U.S.C. 119(b).

Claim Objections

2. Claims 13, 15 and 16 are objected to because of the following informalities: Claims 13, 15 and 16 are system claims that depend on method claims 12 and 14. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2654

4. Claims 1-4, 5-7, 9-12, and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Hermansky et al., (5,165,008).

As per claim 1, Hermansky et al., teach a speech processing system for processing an input speech spectrum vector comprising:

a perceptual speech processor for perceptually processing the input speech spectrum vector to generate a perceptual spectrum (Col.11, lines 17-35);

a storage device for storing a plurality of reference spectrum vectors (Col.3, lines 36-48, Col.4, lines 43-46); and,

a phonetic feature mapper, coupler to said perceptual speech processor and to said storage device, for mapping said perceptual spectrum on to said plurality of reference spectrum vectors (Col.5, line 60 – Col.6, line 10).

As per claim 2, Hermansky et al., teach the speech processing system of claim 1, wherein said perceptual speech processor comprises:

a masking effector for noise masking the input speech spectrum vector to generate a masked input speech spectrum vector (Col.11, lines 17-35);

a minimum audible field curve renormalizer, coupled to said masking effector, for renormalizing said masked input speech spectrum vector responsive to a minimum audible field to generate a renormalized masked input speech spectrum vector (Col.7, lines 50-67); and,

a mel-scale resampler, coupled to said minimum audible field renormalizer, for translating said renormalized masked input speech spectrum vector to mel-scale (Col.7, line 50 – Col.8, line 67).

As per claim 3, Hermansky et al., teach the speech processing system of claim 1 wherein said phonetic feature mapper comprises:

a projection similarity generator, coupled to said storage device, for generating a plurality of projection similarity calculations of the input spectrum vector onto said plurality of reference spectrum vectors (Col.5, line 60 – Col.6, line 10);

a relative projection similarity generator, coupled to said storage device, for generating a plurality of relative projection similarity calculations of the input spectrum vector onto said plurality of reference spectrum vectors (Col.5, line 60 – Col.6, line 10); and,

a selective, coupled to said projector similarity generator and to said relative projection similarity generator, for selecting a projection from between said projection similarity generator calculations and said relative projection similarity generator calculations responsive to the relative values of the projection similarity and relative projective similarity of the input speech spectrum vector on said plurality of reference spectrum vectors (Col.5, line 60 – Col.6, line 10).

Art Unit: 2654

As per claim 4, Hermansky et al., teach the speech processing system of claim 3, wherein said plurality of reference spectrum vectors is comprised of plurality of stationary vowels (abstract, col.11, line 17-35).

As per claim 6, Hermansky et al., teach a speech recognition system for recognizing a sampled speech spectrum vector comprising:

a fast Fourier transform analyzer for generating Fourier transforms of the sampled speech spectrum vector (Col.5, lines 15-35, Col.9, lines 18-23);

a perceptual speech processor, coupled to said fast Fourier transform analyzer, for processing said Fourier transforms to generate a perceptual spectrum (Col.11, lines 17-35);

a storage device for storing a plurality of reference spectrum vectors (Col.3, lines 36-48, Col.4, lines 43-46);

a phonetic feature mapper, coupled to said perceptual speech processor and to said storage device, for mapping said perceptual spectrum to said plurality of reference spectrum vectors, thereby selecting at least one reference vector of greatest similarity to said perceptual spectrum (Col.5, line 60 – Col.6, line 10);
and,

a continuous HMM recognizer, coupled to said phonetic feature mapper, for recognizing said at least one reference vector (Fig.7).

Art Unit: 2654

As per claim 7, Hermansky et al., teach the speech recognition system of claim 6, wherein said plurality of reference spectrum vectors is comprised of a plurality of stationary vowels (abstract, col.11, line 17-35).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, 8, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hermansky et al., (5,165,008) in view of Takagi (5,907,826).

Hermansky et al., while teaching said plurality of stationary vowels, do not specifically teach the vowels comprising nine stationary Mandarin vowels. Takagi does teach stationary vowels in a tonal language such as Chinese mandarin (Col.1, lines 40-47, Figure 5, Col.4, line 61 – Col.5, line 29). Therefore it would have been obvious to one with ordinary skill in the art at the time of invention to incorporate the method of identifying vowels in a tonal language as taught by Takagi in the method of Hermansky et al., because the would effectively avoid vowel/consonant segmentation errors.

Claims 9-16 are directed toward a method similar in scope and content to the apparatus claims 1-8, and are rejected under similar rationale.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fette et al., (6,199,040) teach a system and method for communicating a perceptually encoded speech spectrum signal.

Meyer et al., (5,878,392) teach speech recognition using recursive time-domain high-pass filtering of spectral feature vectors.

Nomura (5,832,180) teaches determination of gain for pitch period in coding of speech signal.

Ohora et al., (5,359,695) teach a speech perception apparatus.

Kabal et al., (6,704,705) teach a method and apparatus for perceptual audio coding.

Takagi (5,655,057) teaches a speech recognition apparatus.

Hall, II et al., (5,535,300) teach perceptual coding of audio signals using entropy coding and/or multiple power spectra.

Art Unit: 2654

Pawlewski et al., (5,583,961) teach speaker recognition using spectral coefficients normalized with respect to unequal frequency bands.

Nitta (5,649,056) teaches a speech recognition system and method which permits a speaker's utterance to be recognized using a Hidden Markov Model with subsequent calculation reduction.

Ukita (4,924,518) teaches phoneme similarity calculating apparatus.

Downey (6,078,884) teaches a pattern recognition apparatus that uses a recognition processor for processing an input signal to indicate its similarity to allowed sequences of reference patterns to be recognized.

Hermansky et al., (5,450,522) teach an auditory model for parametrization of speech.

Petroni et al., (6,098,040) teach a method and apparatus for providing an improved feature set in speech recognition by performing noise cancellation and background masking.

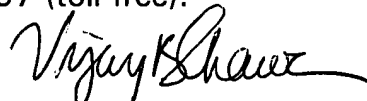
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vijay B. Chawan whose telephone number is (703) 305-3836. The examiner can normally be reached on Monday Through Thursday 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The

Art Unit: 2654

fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vijay B. Chawan
Primary Examiner
Art Unit 2654

Vbc
12/7/04

**VIJAY CHAWAN
PRIMARY EXAMINER**